

$$2x - 8 + 3x - 10 = 17$$

$$RS = 6$$

$$ST = 11$$

$$5x - 18 = 17$$

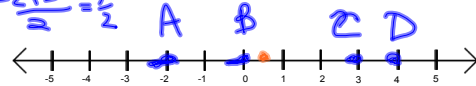
$$5x = 35$$

$$x = 7$$

1.3 Use Midpoint and Distance Formulas

$$AC = |3 - -2| = 5$$

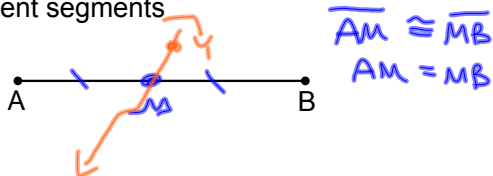
$$\frac{-2+3}{2} = \frac{1}{2}$$



Find midpoint-average coordinates
Find distance-subtract coordinates

Midpoint of a Segment

Midpoint—point that divides a segment into two congruent segments



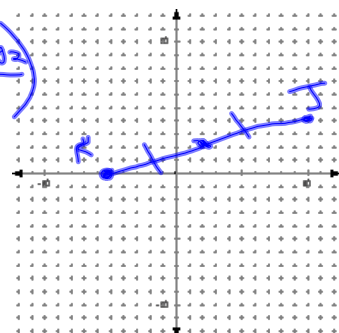
Segment Bisector—a point, ray, segment, line, or plane that intersects a segment at its midpoint

MY bisects segment AB

Find the midpoint.
J(10,4) K(-5, 0)

$$M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

$$M(2.5, 2)$$



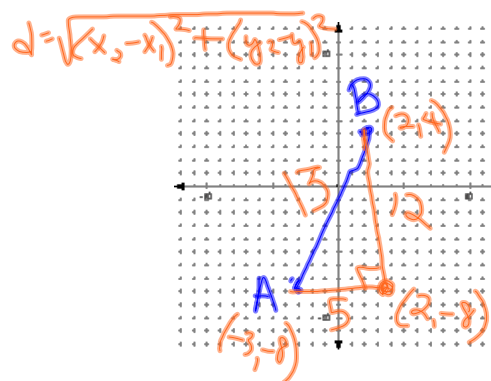
Do Find the midpoint

1. $(4, -6)$ $(-3, 2)$

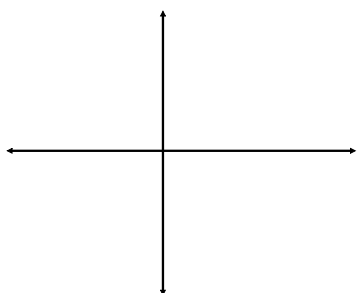
2. $(-4, -3)$ $(8, 5)$

$(\frac{1}{2}, -2)$
 $(2, 1)$

Find the distance between A(-3,-8) and B(2,4).



In General:



The distance formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

A(-3, -8) B(2, 4)

$$d = \sqrt{(2 - -3)^2 + (4 - -8)^2}$$

$\begin{matrix} 5 & 12 \\ 25 & + & 144 \end{matrix} = \sqrt{169} = 13$

Find MN and OP

Do

$$1. M(-5, -2) N(1, 4) = 6\sqrt{2}$$

$$2. O(-1, -1) P(20, 6) = 7\sqrt{10}$$

M is the midpoint of \overline{UD}

$$U(5, 2) \quad M(\underline{3}, -1) \quad D(?, ?) \quad D(1, -4)$$

$$3 = \frac{5+x}{2}$$

$$6 = 5+x$$

$$1 = x$$

$$-1 = \frac{2+y}{2}$$

$$-2 = 2+y$$

$$-4 = y$$

M is the midpoint of \overline{UD}

$$U(-1, 2) \quad M(-6, 8) \quad D(?, ?)$$

$$(-11, 14)$$

Do

$$1. U(-5, -3) \quad M(-6, 4) \quad \text{Find } D(-7, 11)$$

$$2. M(-3, 3) \quad D(-14, 12) \quad \text{Find } U(8, -6)$$

HW

p19-20

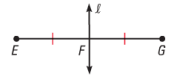
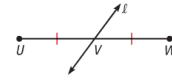
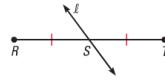
#s 3-5, 11-15, 17, 18, 25-27, 31-33, 43

FINDING LENGTHS Line ℓ bisects the segment. Find the indicated length.

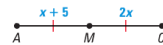
3. Find RT if $RS = 5\frac{1}{8}$ in.

4. Find UW if $VW = \frac{5}{8}$ in.

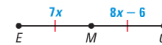
5. Find EG if $EF = 13$ cm.

**ALGEBRA** In each diagram, M is the midpoint of the segment. Find the indicated length.

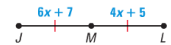
11. Find AM .



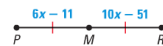
12. Find EM .



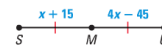
13. Find JM .



14. Find PR .



15. Find SU .

**FINDING MIDPOINTS** Find the coordinates of the midpoint of the segment with the given endpoints.

17. $C(3, 5)$ and $D(7, 5)$

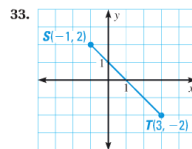
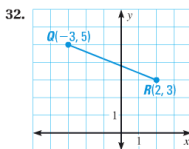
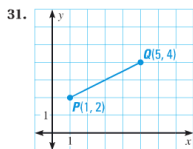
18. $E(0, 4)$ and $F(4, 3)$

FINDING ENDPOINTS Use the given endpoint R and midpoint M of \overline{RS} to find the coordinates of the other endpoint S .

25. $R(3, 0)$, $M(0, 5)$

26. $R(5, 1)$, $M(1, 4)$

27. $R(6, -2)$, $M(5, 3)$

DISTANCE FORMULA Find the length of the segment. Round to the nearest tenth of a unit.**COMPARING LENGTHS** The endpoints of two segments are given. Find each segment length. Tell whether the segments are congruent.

43. \overline{AB} : $A(0, 2)$, $B(-3, 8)$

\overline{CD} : $C(-2, 2)$, $D(0, -4)$